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THE EFFECTS OF AUTOMATION ON THE  
DEPERSONALIZATION OF CANADIAN  
BANK EMPLOYEES

by



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A THESIS

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THE UNIVERSITY OF ALBERTA  
FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend  
to the Faculty of Graduate Studies for acceptance, a thesis entitled  
"The Effects of Automation on the Depersonalization of Canadian Bank  
Employees" submitted by Douglas Edmund Allen in partial fulfilment of  
the requirements for the degree of Master of Business Administration.



## ABSTRACT

Many of the behavioral implications of increased automation, have rarely been questioned in Canada. The objective of this study is to empirically investigate the following hypothesis: Increased automation causes greater depersonalization for Canadian bank employees.

To attain this objective an attitude scale, indicative of the level of depersonalization, was applied to some twenty-four Canadian bank employees. Changes in depersonalization, due to automation, were disclosed by the use of a nonparametric statistical technique. The results were analyzed in light of those variables particularly relevant to the Canadian banking environment.

In general, the results of the study reject the hypothesis that increased automation causes greater depersonalization for Canadian bank employees. It is apparent, however, that certain employees, in particular job classifications, experience a change in depersonalization due to increased automation. Employees, in supervisory positions, experience a reduction in the level of depersonalization while employees, in clerical positions, experience a significant increase in the level of depersonalization due to increased automation. These findings are somewhat contrary to what the theory suggests and what other empirical research has concluded.



## ACKNOWLEDGEMENT

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## TABLE OF CONTENTS

<u>CHAPTER</u>		<u>PAGE</u>
I.	INTRODUCTION . . . . .	1
II.	A SURVEY OF THE LITERATURE . . . . .	4
	The American Experience . . . . .	4
	The Canadian Experience . . . . .	9
III.	METHODOLOGY . . . . .	12
	Theoretical Framework . . . . .	12
	Hypotheses . . . . .	13
	The Original Study . . . . .	14
	The Questionnaire . . . . .	15
	Statistical Inference . . . . .	18
IV.	THE EMPIRICAL STUDY . . . . .	22
	Background Information . . . . .	22
	Bank Acceptance . . . . .	22
	The Banking Environment . . . . .	23
	The Findings of the Study . . . . .	26
	Level 1 . . . . .	27
	Level 2 . . . . .	28
	Level 3 . . . . .	28
	Staff Members . . . . .	29
V.	ANALYSIS OF THE STUDY . . . . .	31
	A Comparative Analysis . . . . .	31
	The Results From a Banking Point of View . . . . .	33
	The Organization in Perspective . . . . .	37
VI.	SUMMARY AND CONCLUSIONS . . . . .	40
	BIBLIOGRAPHY . . . . .	42
	APPENDIX I . . . . .	45
	APPENDIX II . . . . .	48
	APPENDIX III . . . . .	50



## Table of Contents (Continued)

<u>CHAPTER</u>	<u>PAGE</u>
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APPENDIX IV . . . . .	53
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## LIST OF TABLES

<u>TABLE</u>		<u>PAGE</u>
4.1	Bank Branches Approached in the Study . . . . .	24
4.2	Number of Employees Interviewed According to Metropolitan Branch . . . . .	25
4.3	Number of Employees Interviewed According to Job Classification . . . . .	26
4.4	Direction and Significance of Changes in Depersonalization for Bank Employees by Job Classification . . . . .	30
5.1	A Comparison Between this Study (Canadian Bank Employees (C) ) and Champion's Study (American Bank Employees (A)) . . . . .	31



## CHAPTER I

### INTRODUCTION

Over the past decade it has become increasingly evident that organizations of all types are relying more heavily on technological developments to run their daily operations. Financial institutions are no exception as exemplified by their recent dependence on electronic data processing equipment.<sup>1</sup> Banks, in particular, are finding automated systems conducive to reducing the routine of office work load.

Unfortunately, the behavioral implications of increased automation are often overshadowed by the technical advantages to be gained. Banks, as well as other organizations, are extremely reluctant to probe into the behavioral areas, due to the vast number of variables involved which often are not quantifiable and thus difficult to measure.

In any organization, management is faced with several formidable objectives. It is apparent however, that two objectives are common to all organizations:

1. Management must adhere to a philosophy that is compatible with the objectives of the shareholders, whether the organization is a public or a private entity. This objective may be defined in terms of profit maximization, sales maximization, or in any manner that

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<sup>1</sup> J. A. Vaughan and others, The Impact of Computers on Small and Medium-Sized Banks (New York: Federal Deposit Insurance Corporation, 1968), p. 3.



can be equated with "economic success".

2. Management must adhere to a philosophy that is conducive to "social responsibility". In other words, management must respond to its environment so that some degree of mutual benefit evolves.

It is the fulfilment of these objectives, or lack of fulfilment, that often determines the success of management and the resultant health of the organization.

Argyris suggests that "the primary task of any management is to weld its people into an effective organization."<sup>2</sup> There seems little question, that unless both the technical and the behavioral implications, of increased automation, are examined, organizational effectiveness can only be achieved at the suboptimal level.

This study is concerned with bank automation and its effect on employee depersonalization. For purposes of reference it seems pertinent to define automation and depersonalization as used in this paper:

"Automation is defined as a production process which uses electronic and/or other mechanical means to control the quantity and quality of a product."<sup>3</sup>

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<sup>2</sup> Chris Argyris, "Human Relations in a Bank," Harvard Business Review, XXXII, 5 (1954), 63.

<sup>3</sup> D. J. Champion, "Depersonalization: Some Implications for Bank Employees," The Journal of Industrial Engineering, XVIII, 3 (1967), 223.



"Depersonalization is a condition where human control is removed from the outcome of one's work."<sup>4</sup>

The purpose of this study will be to empirically test the following hypothesis:

- Increased automation changes the degree of depersonalization for Canadian bank employees.

Twenty-four employees, from a large Canadian chartered bank, are used as a representative sample of those undergoing automated change. An attitude scale, indicative of the perceived degree of depersonalization, is used with the twenty-four employees completing the questionnaire on a before and after automation basis. A nonparametric statistical technique is employed to determine the actual significance and direction of the depersonalization change, if any, generated from increased automation.

The results of the empirical study are analyzed in light of organizational theory and the behavioral variables that are particularly pertinent to the Canadian banking environment.

It is hoped that this study will make a valuable contribution to human relation awareness, as well as to provide a framework for future study in Canadian organizations, in particular, Canadian banks.

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<sup>4</sup> Ibid., 224. See also:  
R. K. Merton, Social Theory and Social Structure, (Toronto: Collier - MacMillan, 1964), pp. 202-04.



## CHAPTER II

### A SURVEY OF THE LITERATURE

Some progress has been made in investigating the social impact of automation although public entities, compared to private concerns, seem far more willing to undertake such research. The United States Department of Labor has sponsored a number of case studies in a variety of business environments.<sup>5</sup> Banks, in both the United States and Canada, have received considerable attention in the area of technical progress although research on the behavioral implications of such progress is, at best, somewhat superficial.

#### The American Experience

American banks have had the use of electronic data processing equipment for several years. Not long ago, it was suggested that smaller banks used automation partly for purposes of industry status.<sup>6</sup> It is now apparent, however, that the glamour of technical advancement is strictly a secondary consideration

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<sup>5</sup> U. S., Department of Labor, Bureau of Labor Statistics, A Case Study of a Modernized Petroleum Industry, BLS Report No. 120 (Washington: Government Printing Office, 1957). See also:

U. S., Department of Labor, Manpower Planning to Adapt to New Technology at an Electric and Gas Utility, BLS Report, No. 293, April, 1965 (Washington: Government Printing Office, 1965).

<sup>6</sup> J. A. Vaughan and others, op. cit., p. 9.



in light of management's desire to:

1. cut costs to a minimum,
2. satisfy ever increasing consumer demands,
3. handle large volumes of routine office work, with a minimum amount of human involvement, and
4. respond to a market where time is an extremely important factor.

In the 1950's, bank problems were beginning to gain some attention.

Argyris<sup>7</sup> studied the effect of managerial decisions on the organization as a whole.

The setting was a bank with the results showing the existence of human relation problems and the inability of bank management to deal with such problems.

The complexity of such problems was clearly brought out in a later bank case study done by Argyris.<sup>8</sup> Argyris dealt with three "systems of variables" that were interrelated and thus had to be researched simultaneously before an organization could be effectively studied.<sup>9</sup> It was becoming increasingly clear that a static approach to organization study was not suffice. Although the literature contained some pertinent analysis on organizational climate and effectiveness

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<sup>7</sup> Chris Argyris, "Human Relations in a Bank," 63-72.

<sup>8</sup> Chris Argyris, "Problems in Conceptualizing Organizational Climate: A Case Study of a Bank," Administrative Science Quarterly, II (1958), 501-19.

<sup>9</sup> Chris Argyris, "Problems in Conceptualizing Organizational Climate: A Case Study of a Bank," 501.



the major problem was a lack of empirical research.

A most revealing study was undertaken by Dean J. Champion<sup>10</sup> who measured the depersonalization effects of automation in a small midwestern bank. Champion developed a framework in which to measure one particular impact of increased automation. A before and after questionnaire was applied to some twenty-two bank employees. The results were tested by the use of a nonparametric statistical technique which disclosed that increased automation does generate greater depersonalization among bank employees. Although the results were not statistically significant two implications evolved:

1. there was a significant correlation between job dissatisfaction and depersonalization, and
2. there was a significant correlation between the reduction in one's decision-making power and depersonalization.<sup>11</sup>

Although the statistical results of Champion's study do not warrant further generalization the study did avoid some of the criticisms attributed to earlier United States Department of Labor studies:

"The findings of these various studies have often seemed contradictory, and this is partly attributable to certain methodological inconsistencies, different forms of automation, and differential employee involvement with automated production processes."<sup>12</sup>

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<sup>10</sup> D. J. Champion, op. cit., 223-226.

<sup>11</sup> Ibid., 225.

<sup>12</sup> Ibid., 223.



A more recent piece of research was undertaken by the Federal Deposit Insurance Corporation<sup>13</sup> in a first in a series on problems of bank operations and bank regulations. Some fifty-seven banks were encompassed in the study which dealt with seven major areas of bank automation:

1. the decision to automate,
2. the conversion period,
3. the impact of the computer on the information system,
4. effects of automation on banking jobs,
5. attitudes toward the use of computers and the computer staff,
6. effects of automation on some organization variables, and
7. application of research findings.

The study was designed to determine what changes a bank undergoes, in light of automation, and to outline specific guidelines that banks should follow when actual conversion takes place. Information was gathered through written records, field interviews, and questionnaires. The most pertinent suggestion concerned the entire conversion process:

"Too much attention is focused on the immediate goal of achieving the first conversion and not enough on the more significant factors of integrated planning of the conversion in the context of the total automation program."<sup>14</sup>

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<sup>13</sup> J. A. Vaughan and others, op. cit., pp. 1 - 27.

<sup>14</sup> Ibid., p. 12.



Of late, American banks, and their problems stemming from automation, are gaining considerable exposure in Banking - Journal of the American Bankers Association. Management is seen by most as the major problem. A recent article by Freund substantiates this position:

"Top management's lack of involvement is probably the single major problem of bank automation."<sup>15</sup>

Management's lack of involvement is usually a result of two conditions:

1. Bank management is usually comprised of an old managerial elite.

This elite is somewhat disinterested in certain bank changes since their careers will not be affected by new technology.

2. Some of the technical and the behavioral details of automation are often beyond the grasp of a management void of specialized training. Only recently have banks been willing to hire outside expertise.

Lack of staff training and orientation toward automation is now being alleviated. As suggested by Carter, however, "the anarchy of the computer technician is still a reality in banking as in other industries."<sup>16</sup>

The concern of bank staff is usually centered around the effect of

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<sup>15</sup> R. W. Freund, "Three Problems of Bank Automation," Banking - Journal of the American Bankers Association, May, 1969, p. 96.

<sup>16</sup> N. H. Carter, "Automation and Education," Banking - Journal of the American Bankers Association, May, 1969, p. 42.



automation on staff complements. Although automation has had little effect on reducing staff size, the fear of such an occurrence still remains a factor contributing to considerable stress and anxiety for the employee.<sup>17</sup>

American banks are making considerable progress in "debugging" the behavioral problems in the automated system. The reason being that the costs, of these behavioral dysfunctions, are exceeding all initial expectations. As long as these costs are appearing on bank balance sheets one can foresee that greater attention will be given to this area in the near future.

#### The Canadian Experience

Canadian journals and industrial magazines have yet to direct their attention to the behavioral implications of bank automation. This is, in part, due to the fact that Canadian banks are some ten years behind their American counter-parts in installing the latest electronic data processing equipment. It has been suggested that even American banks have only scratched the service when it comes to applying computer facilities to bank services.<sup>18</sup> If this is the case, Canadian banks should experience a tremendous growth in automated facilities in the years to come.

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<sup>17</sup> S.M. Blumner and R.B. Hutchinson, "How Bank Automation Can Affect Employment," Banking - Journal of the American Bankers Association, January, 1970, p. 78.

<sup>18</sup> G.W. Mitchell, "EDP and Expanding Bank Service," Banking - Journal of the American Bankers Association, May, 1969, p. 39.



Canadian banks are, at present, doing most of their own research in analyzing their automated environment. Unfortunately, bank practices and studies are traditionally conducted in an atmosphere of secrecy. The result has been that bank documents on automation are seldom, if ever, published.

The primary source for a Canadian point of view on bank automation is the Canadian Bankers Association Bulletin. Little attempt is being made, however, to gather empirical evidence or to construct general behavioral guidelines that would aid banks in dealing with an automated change.

Most of the comments on Canadian bank automation are directed toward the lack of educational facilities available to the employee.<sup>19</sup> Although American bankers are becoming better educated, in Canada, "banking is still seen by many as a profession that does not require an advanced or broad educational background."<sup>20</sup> This problem alone seems to be creating significant dysfunctions when automation is undertaken. The crux of the problem is that Canadian banks have yet to learn that dynamic problems cannot be solved through static techniques.

The most promising factor is that Canadian banks have the American experience to observe. The Canadian banks still have two major challenges:

1. to make a concerted effort at fully understanding their automated changes, and

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<sup>19</sup> Canadian Bankers Association Bulletin, II, 2 (May, 1968), 2.

<sup>20</sup> J. A. Vaughan and others, op. cit., p. 19.



2. to gather empirical data so that what management thinks is happening can be put to some test.

This study presents one approach that management can use in determining some of the behavioral implications of increased automation.



## CHAPTER III

### METHODOLOGY

#### Theoretical Framework

In determining the depersonalization effects of automation on bank employees it is essential to develop a framework in which to test the variable under consideration. In any behavioral study measurement of a particular variable requires certain basic assumptions. In this study the writer is measuring an attitude, depersonalization, to which Thurstone's definition of attitude and opinion will apply:

"The concept of attitude will be used here to denote the sum total of a man's inclinations and feelings, prejudice or bias, preconceived notions, ideas, fears, threats, and convictions about any specified topic." <sup>21</sup>

"The concept 'opinion' will here mean a verbal expression of attitude." <sup>22</sup>

In this study, attitude measurement is strictly limited to depersonalization or the removal of human control from the outcome of one's work in a banking environment. Depersonalization will be measured as being a function of increased automation.

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<sup>21</sup> L. L. Thurstone, "Attitudes Can Be Measured," Readings in Attitude Theory and Measurement, ed. Martin Fishbein (New York: John Wiley and Sons, Inc., 1967), p. 77.

<sup>22</sup> Ibid.



It seems pertinent for purposes of this study to discuss the type of automation that the Bank under study is now using. As mentioned earlier, automation is a production process controlling the quantity and quality of a product. In a banking sense this product encompasses numerous financial services.

The Bank's present stage of automation is called Demand Deposit Accounting (DDA) and it handles the bulk of routine work with respect to business accounts, personal chequing accounts and payments, such as money orders and domestic and foreign drafts. The main advantages of Demand Deposit Accounting are that the posting of accounts is eliminated at the branch level; processing transactions is done with a high degree of accuracy and branch staff have considerably more time for serving customers.

There is little question that the growth of automation in Canadian banks is changing the working environment for every bank employee. Today every employee must have some grasp of the automated system in order to function properly. This condition provides the writer with the appropriate setting so that one particular aspect of automation can be ascertained.

### Hypotheses

Since the Canadian literature is void of empirical data on bank automation, it is the writer's purpose to present an empirical study on one particular aspect of automation. This aspect, depersonalization, will be measured to determine the change, if any, incurred by bank employees who have been transferred



from non-automated to automated branches. For purposes of this study the following null hypothesis and research or alternative hypothesis will apply:

1. Null Hypothesis ( $H_0$ ): Increased automation has no effect on the depersonalization of Canadian bank employees.
2. Research Hypothesis ( $H_1$ ): Increased automation changes the degree of depersonalization for Canadian bank employees.<sup>23</sup>

#### The Original Study

This study will be conducted in a similar fashion to that undertaken by Champion<sup>24</sup> whose purpose was to develop an appropriate framework for measuring the depersonalization effects of automation. Although some changes in format are used, Champion's basic approach is methodologically consistent with the purpose of this study.

The basic difference in this study, compared to that of Champion's, stems from the apparent differences between the Canadian and American banking systems. Champion's study is conducted in a small United States bank. The Canadian system is basically a vast number of branch banks in a chartered system. This makes it necessary to deal with a large bank whose computer facilities are centralized according to districts. Items for processing are thus done outside each

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<sup>23</sup> The general research hypothesis is as stated, although, for particular samples the hypothesis may be changed to be indicative of the directional change of depersonalization.

<sup>24</sup> D. J. Champion, op. cit., 224.



individual branch.

### The Questionnaire

A before and after type of questionnaire is applied since the variable under consideration is being measured for a change due to increased automation. It must be noted that attitude scales are not perfect instruments but, if properly designed, are better than individual reports or general observation.<sup>25</sup>

The ideal before and after questionnaire is applied before automation and several months after automation has taken place in order to rule out any significant bias resulting from previous exposure to the questionnaire. Two constraints make this procedure impossible in the Canadian banking environment. The primary reason is that bank automation was undertaken some three years ago by the major chartered banks in Canada. A second constraint is that bank automation is usually implemented in a number of phases with a lag period of several months taking place before the entire automated system is in operation.

The questionnaire is identical to that used by Champion.<sup>26</sup> The questionnaire is comprised of ten statements designed to reflect the level of employee depersonalization. The statements are short, unambiguous and do not deal with factual matters. Appendix 1 contains the questionnaire and its corresponding statements.

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<sup>25</sup> Joseph Tiffin and E. J. McCormick, Industrial Psychology (Englewood Cliffs: Prentice-Hall, Inc., 1965), p. 326.

<sup>26</sup> D. J. Champion, op. cit., 224.



The writer will also use opinions and comments of each employer to substantiate the results.

The questionnaire was pretested on some six bank employees in order to determine the reliability and clarity of each statement. Employees ranged from supervisory personnel to filing clerks.

Likert-type responses are chosen because they are simple to measure and results are found to correlate very highly with the more complex Thurstone method.<sup>27</sup> Similar to Champion's study, six different responses are available for each statement in the questionnaire with responses ranging from strongly agree to strongly disagree and scores from 10 to 60 applied to reflect the degree of depersonalization. Statements apply in both directions to limit possible bias responses. The responses, accompanying individual statements, are shown in Appendix I. A neutral response is excluded because of pretesting results which disclosed that the addition of such made the responses awkward and, at times, invalid.

The actual sample consists of some twenty-four employees who have recently been transferred from non-automated branches to branches using automated facilities. Appendix II contains the present branch of each employee and the area where he previously worked. The sample was drawn from the three metropolitan areas of Calgary, Edmonton and Vancouver where a total of thirty-five employees were suitable for responding to the questionnaire. Eleven of the thirty-five employees

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<sup>27</sup> Joseph Tiffin and E. J. McCormick, op. cit., p. 326.



were not interviewed because of holidays, course training, and sickness.

The questionnaire was applied instantaneously even though it is of a before and after design. The present state of automation made this method the only one feasible. To facilitate the before questionnaire the writer spent some time with each employee asking the employee about his branch when automation was not in effect. It is felt that this approach aided considerably in gaining accurate before questionnaire results. There is no question that a before and after questionnaire, applied instantaneously, contains some inherent bias. It is felt, however, that the results obtained from such a method are still indicative of directional change if not the actual magnitude. This, of course, requires that employees are recently transferred from their previous environment.

Since the purpose of the study is to determine the effect of automation on employee depersonalization it seemed reasonable to test for a change on different job categories as well as on the entire staff. Three basic classifications were used for staff members:

1. Supervisory (Level 1)
2. Assistant (Level 2)
3. Clerical (Level 3)

This was done to glean information on reasonably sized samples and to avoid the small sample size of categories apparent in the Champion study.<sup>28</sup> Job

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<sup>28</sup> D. J. Champion, op. cit., 225.



classifications are somewhat overlapping in Canadian banks and thus further categorizing is relatively meaningless.

Level 1, or the supervisory category, encompasses those bank employees who are responsible for the daily operation in a particular bank. These people are usually male and are involved in managerial decisions. They are usually responsible for seeing that the rest of the employees carry out their daily tasks. Level 2 employees are those more involved in automation. Their job is mainly to prepare items for computer processing and a complete understanding of the automated system is essential. These employees are usually female and the job carries a moderate amount of authority and status within the organization. Level 3 employees are usually tellers and filing clerks whose job entails several tasks, none of which require a full understanding of the system. Level 3 employees are strictly non-supervisory, their position is something less than prestigious within the banking community.

#### Statistical Inference

The results of the questionnaires are tested by the use of a nonparametric statistical device. Behavioral variable measurement is rarely conducive to parametric testing and thus the use of nonparametric tests plays a vital role in behavioral science research.<sup>29</sup> Nonparametric tests avoid making restrictive

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<sup>29</sup> Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences (New York: MacGraw Hill, 1956), p. 31.



assumptions concerning the normality and variances of the population distributions underlying the samples.

The Wilcoxon Matched-Pairs Signed-Ranks Test is used in determining the change, if any, in employee depersonalization. In this test, it is possible to "(a) tell which member of a pair is 'greater than' which, i.e. tell the sign of the difference between any pair, and (b) rank the differences in order of absolute size."<sup>30</sup> In other words, the Wilcoxon Test gives the direction of the change as well as the magnitude. The test is applicable because ordered metric scale data is used and the sample is related in a before and after design where the employees act as their own control.

To obtain explicit results, the following modification of the Z test is used:

$$- \quad Z = \frac{T - \mu_T}{\sigma_T}$$

-  $T$  = the sum of the ranks with the less frequent sign.

$$- \quad \mu_T \text{ (mean)} = \frac{N(N + 1)}{4}$$

$$- \quad \sigma_T \text{ (standard deviation)} = \sqrt{\frac{N(N + 1)(2N + 1)}{24}}$$

The corresponding Z value can be interpreted as a one or two-tailed test depending on whether the direction of the differences in the scores can be

<sup>30</sup>

Ibid., p. 76.



predetermined.

In using the Wilcoxon Test, one is faced with choosing an appropriate level of significance in order to safely accept or reject the hypotheses stated earlier in this chapter. The level of significance ( $\alpha$ ) is assumed for this study to be at the 0.05 level. Two types of errors are possible in determining the results:

1. Type 1 error - is to reject  $H_0$  when in fact it is true.
2. Type 2 error - is to accept  $H_0$  when in fact it is false.

The probability of committing a Type 1 error is given by  $\alpha$ , or 0.05, as assumed in this study. The probability of a Type 2 error is also 0.05 since the power efficiency of the Wilcoxon Test is near 95 per cent.<sup>31</sup>

The significance level is chosen at the 0.05 level for two reasons:

1. The data requires a fairly accurate measurement level although the implication of committing a Type 1 error does not have the ramifications in this study as it would if the study results determined a surgeon's decision on whether to operate or not.
2. The chances of making a Type 2 error are increased when one reduces the chances of making a Type 1 error. It is therefore necessary to obtain some type of compromise between the two possibilities.<sup>32</sup>

Admittedly, the preceding framework is not ideal and thus will not provide

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<sup>31</sup> Ibid., p. 83.

<sup>32</sup> Ibid., p. 10.



perfect results. This is an assumption one must accept in dealing with behavioral data. This fact does not warrant a haphazard approach to behavioral measurement; it merely restricts the resulting generalizations of the findings. It is felt that the framework provided will provide meaningful results that are indicative of what impact increased automation has on employee depersonalization. It is the writer's purpose to empirically test one variable, depersonalization. Although several other variables may correlate with depersonalization, it is not the purpose of this research to empirically test this possibility.



## CHAPTER IV

### THE EMPIRICAL STUDY

#### Background Information

To undertake an empirical study one is faced with fully understanding the environment in which the study is to be applied. The writer is fortunate in having two summers experience with the Bank under study. The writer is familiar with bank office routine and has considerable understanding of the entire integrated system. When dealing with individual job classification the writer found a working relationship with bank employees to be of great assistance.

The writer must also acknowledge the Bank's written material available to all banking personnel. A basic training manual, personnel manuals, and daily branch bulletins were made available. This provided valuable insight into bank changes as well as some information on the general approach and attitude that top management extends to its employees.

#### Bank Acceptance

Since a study of this nature is new to the Canadian banking environment, bank acceptance proved to be somewhat difficult to obtain. Initially, the writer was informed that certain banks would be automating country branches. As shown in Appendix III, Exhibit 1, a covering letter, along with a copy of Champion's



study was sent to these banks. It was hoped that one of the banks would allow the writer to apply an ideal before and after questionnaire to certain employees. Unfortunately, the responses were unfavorable, partly due to conflicting automation dates, an insufficient automated change, and a general fear, expressed by banking management, regarding an "outside individual" probing into bank affairs.

The only feasible study was in the bank in which the writer had spent some two summers in employment. Although bank automation had already been undertaken, it was felt that an instantaneous questionnaire would prove of value. The Bank's district office in Calgary spent considerable time in providing a list of those employees necessary for the study as well as a covering letter to the branches concerned to provide the writer with access to individual branches without being delayed and refused by local bank employees. Appendix III, Exhibit 2, contains the Bank's covering letter.

#### The Banking Environment

The writer spent some three weeks in gathering the necessary empirical data. The Bank had provided a list of employees and their corresponding branches. Table 4.1 gives a breakdown of how many branches were approached in each of the three centres.

Naturally, not all branches approached had employees acceptable for the sample. In all, twenty-four employees were interviewed and asked to complete



a before and after questionnaire. Table 4.2 provides a geographical breakdown of those employees interviewed.

TABLE 4.1  
BANK BRANCHES APPROACHED IN THE STUDY

Metropolitan Centre	Number of Branches	Number of Branches Approached Regarding the Study
Calgary	26	15
Edmonton	26	26
Vancouver	40	13
TOTAL	92	54

The twenty-four employees in the sample were asked to fill out the "before" questionnaire according to how they felt about the statements prior to coming to an automated branch. This was not overly difficult since all employees interviewed had only been in an automated branch for a maximum of sixty days. Comments and opinions were welcomed with most employees quite receptive to discussing their particular job in a Non-Demand Deposit Account branch.

The "after" questionnaire was answered by responding to the statements as how the employee felt about his job now that he was in an automated branch.



Again comments were welcomed with most employees quite receptive to discussing their job in the context of the entire automated system. Employees were asked to elaborate on any particular area if they felt that further discussion would substantiate their response to any particular statement.

TABLE 4.2  
NUMBER OF EMPLOYEES INTERVIEWED ACCORDING TO  
METROPOLITAN BRANCH

Calgary Branch	Employees Interviewed	Edmonton Branch	Employees Interviewed	Vancouver Branch	Employees Interviewed
Main	1	Main	3	Hastings	4
Centre	2	2nd	1	Kerrisdale	1
Crescent	1	North	1	Fraser	1
Fairmont	3	Village	1	---	-
Manitou	1	Jasper	1	---	-
4 St.	1	South	1	---	-
---	-	University	1	---	-
<b>TOTAL</b>	<b>9</b>	<b>TOTAL</b>	<b>9</b>	<b>TOTAL</b>	<b>6</b>
<b>Cumulative Total</b>	<b>9</b>		<b>18</b>		<b>24</b>

Each individual interview lasted, on the average, about twenty minutes. Naturally, this varied depending on the responsiveness of the employee. The personnel manager of each branch was also usually involved. In most cases the



writer had to explain the purpose and the approach of the study, with individual personnel managers suggesting techniques and possible results that may derive from the study.

As discussed in Chapter III, staff members were broken into three classifications based on the level of prestige and authority particular jobs carried with them. Table 4.3 shows the number of employees interviewed according to the particular job classification.

TABLE 4.3  
NUMBER OF EMPLOYEES INTERVIEWED ACCORDING  
TO JOB CLASSIFICATION

Job Classification	Corresponding Number of Employees Interviewed
Supervisor (Level 1)	7
Assistant (Level 2)	10
Clerical (Level 3)	7
Total Number of Employees Interviewed	24

#### The Findings of the Study

Champion's study is based on the following hypotheses:<sup>33</sup>

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<sup>33</sup> D. J. Champion, op. cit., 226.



- 1).  $H_0$ : Increased automation does not change the degree of bank employee depersonalization.
- 2).  $H_1$ : Increased automation generates greater depersonalization among bank employees.

It is worth noting that Champion's research hypothesis constitutes a one-tailed test since the direction of the change is predetermined. The theoretical discussion of EDP in the United States and the corresponding empirical work disclosed similar results to those found by Champion. Undoubtedly, for this reason alone, Champion thought it valid to use a one-tailed test.

Since the Canadian banking environment is quite different to that in the United States and since theoretical issues, on behavioral problems of bank automation are rarely, if ever, discussed in Canada, the writer felt it advisable to use a two-tailed test with the research hypothesis merely stating a change and not the actual direction of the change.

The results will be disclosed for each particular job classification as well as for the over-all staff members.

a). Level 1

Hypotheses:

- 1).  $H_0$ : Increased automation has no effect on the depersonalization of bank supervisors.
- 2).  $H_1$ : Increased automation changes the degree of depersonalization among bank supervisors.



Level 1 employees constitute a sample size of 7 with the results giving a corresponding Z value of 0.92.<sup>34</sup> In other words,  $H_0$  is rejected in favour of  $H_1$  at the 0.36 level of significance. Since 0.36 is well above the accepted level of significance, 0.05,  $H_0$  cannot be rejected in favour of  $H_1$ . Although the change is not significant it is interesting to note that the change is actually reflecting less depersonalization.

b). Level 2

Hypotheses:

- 1).  $H_0$ : Increased automation has no effect on the depersonalization of bank assistants.
- 2).  $H_1$ : Increased automation changes the degree of depersonalization among bank assistants.

Level 2 employees constitute a sample size of 10 with the results giving a corresponding Z value of 0.05. Since this result is not indicative of any change,  $H_0$  cannot be rejected in favour of  $H_1$  at any level of significance and definitely not at the 0.05 level which is assumed to be acceptable for the purpose of this study.

c). Level 3.

Hypotheses:

- 1).  $H_0$ : Increased automation has no effect on the depersonalization of bank clerks.

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<sup>34</sup> As stated earlier the Wilcoxon Test is used for each sample and the modification of the Z test is used to determine the appropriate Z values.



2).  $H_1$ : Increased automation changes the degree of depersonalization among bank clerks.

Level 3 employees constitute a sample size of 7 with the results giving a corresponding Z value of 2.11. In other words,  $H_0$  is rejected in favour of  $H_1$  at the 0.035 level of significance. Since 0.035 is below the accepted level of significance, 0.05,  $H_0$  can be rejected in favour of  $H_1$ . The change is significant and reflects an increase in the depersonalization of bank clerks.

d). Staff Members

Hypotheses:

1).  $H_0$ : Increased automation has no effect on the depersonalization of Canadian bank employees.

2).  $H_1$ : Increased automation changes the degree of depersonalization among Canadian bank employees.

The total number of employees interviewed constitutes a sample size of 24 with a corresponding Z value of 0.70. In other words,  $H_0$  is rejected in favour of  $H_1$  at the 0.48 level of significance. Since 0.48 is well above the accepted level of significance, 0.05,  $H_0$  cannot be rejected in favour of  $H_1$ . Although the change is not significant, the direction of change is toward greater depersonalization for bank employees and opposite to the direction of the depersonalization change for Level 1 employees.

The results of the preceding four samples are summarized in Table 4.4.



TABLE 4.4

DIRECTION AND SIGNIFICANCE OF CHANGES IN  
DEPERSONALIZATION FOR BANK EMPLOYEES BY JOB CLASSIFICATION\*

Job Classification	Sample Size (N)	Direction of Change	Z Value	Significance Level
Level 1 (Supervisory)	7	-	0.92	0.36
Level 2 (Assistant)	10	+	0.05	None
Level 3 (Clerical)	7	+	2.11	0.035
Staff	24	+	0.70	0.48

The results of this empirical study are somewhat surprising and definitely warrant an analysis of the particular variables involved in the Canadian banking environment.

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\* All the values of Table 4.4 are calculated with the Wilcoxon Matched-Pairs Signed - Ranks Test through a modification of the Z Test. Appendix IV discloses individual employee scores along with the preliminary calculations necessary in determining the appropriate Z values.



## CHAPTER V

### ANALYSIS OF THE STUDY

#### A Comparative Analysis

In analyzing the results it seems pertinent to compare the findings of this study with the original study since the framework of both is somewhat similar. Table 5.1 gives the results of both studies.

TABLE 5.1

A COMPARISON BETWEEN THIS STUDY (CANADIAN BANK EMPLOYEES (C))  
AND CHAMPION'S STUDY (AMERICAN BANK EMPLOYEES (A))<sup>35</sup>

Occupation		N		Direction of Change		Z Value		Significance Level	
C	A	C	A	C	A	C	A	C	A
Supervisors	Supervisors	7	3	-	no change	.92	-	.36	no change
Assistants	Bookkeepers	10	7	+	+	.05	.31	no change	.38
Clerks	File Clerks	7	3	+	+	2.11	1.35	.035	.09
Staff	Address Operators	24	22	+	+	.70	1.23	.48	.10

35 Ibid., 225.



Champion found a relatively high correlation between the change toward increased depersonalization and actual changes in tasks performed by each of the occupational divisions.<sup>36</sup> For example, supervisors and desk girls were the least affected by the automated change relative to task responsibility and depersonalization change. The remaining occupations, excluding bookkeepers, experienced a greater loss in responsibility and a resulting greater increase in depersonalization. Bookkeepers received greater responsibility, due to the automated change; the change in the level of depersonalization was insignificant.

In the Canadian study, supervisory positions were not changed due to computer installation although supervisors experienced a decrease in the level of depersonalization. Assistants were greatly affected by the change with regard to job responsibility although no significant change was noted in the level of depersonalization. Clerks, on the other hand, experienced a significant increase in depersonalization although their job was not greatly affected by the conversion. It is interesting to note that clerks were the only group of employees that were more depersonalized after automation in comparison with their American counterparts.

Over-all staff results were somewhat similar between the two studies although the American study indicated a far greater increase in employee depersonalization due to increased automation.

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36 Ibid.



Some of the differences in the two results can be explained by the different techniques implemented in the studies. The American study used relatively small sample sizes. The number of occupational categories was quite large even though bank job classifications are at times somewhat overlapping. The American study was conducted in one branch and thus particular changes in the branch, other than automation, may have induced a greater level of employee depersonalization.

The Canadian study used larger samples, smaller occupational categories, and several banking environments. It is felt, by the writer, that these conditions were more conducive to results indicative of the actual change. Some factors may have proven less conducive to meaningful results. The instantaneous questionnaire, as previously mentioned, undoubtedly contained some inherent bias. The fact that employees had been recently transferred may also have affected the findings.

Some of the possible reasons for the results will be discussed next. It must be noted that empirical testing of any other variables, found in the banking environment, was not within the scope of this study.

#### The Results From a Banking Point of View

In analyzing the results it is useful to refer to Table 4.4. A surprising change was that experienced by supervisors. The change is toward less depersonalization although the results are not significant. This change can be



explained with the aid of several banking variables:

- 1) Staff Work Load - Prior to the introduction of computers the work load in most bank branches was substantially greater than it is today. Although supervisors were not involved in the bulk of the office routine, their resulting staff problems and hours of work were usually the two major grievances expressed by bank supervisors.

Although increased automation has not totally alleviated these two problems it has made a substantial contribution in curbing basic staff problems and in reducing the hours of work. It should be mentioned that, contrary to public belief, most bankers work more than a five hour day.

- 2) Bank Returns - In the last decade bank returns have more than tripled due to a need for more sophisticated profit planning techniques and a substantial increase in government returns. This has put a considerable burden on supervisory personnel due to month-end, quarter-end, and year-end returns. Prior to computer installation, a great deal of time was spent on these returns with over-time becoming a necessity. The installation of Demand Deposit Accounting has helped lighten some of this burden and there is every indication that increased automation in the future will tend to further reduce this particular problem.

- 3) Promotion - Most supervisors, that were interviewed in this study, felt that the use of computers has made the office work more accurate



and thus their performance record and chance for promotion has been somewhat enhanced.

- 4) Training and Bank Literature - The majority of bank training courses have been directed at the supervisors with the hope of making the transition to Demand Deposit Accounting a successful one. These courses have been extremely successful and there seems little question that the directional change of depersonalization is, in part, a function of the banks attempt at educating its supervisors.

Bank literature, on automation, is very much in evidence in every bank branch. The most useful manual deals with the entire Demand Deposit Accounting system and its effect on job positions and office routine.

In analyzing the lack of depersonalization change experienced by bank assistants two factors seem relevant.

1. Female Staff - Most banks have traditionally filled about 70 per cent of their staff positions with women. Bank assistants are usually women and thus managerial philosophy towards female staff plays a rather important role. Women have usually been somewhat neglected in terms of employee benefits, promotion, and status. Lately, management has been promoting women to managerial positions and thus alleviating some of the past inequalities. This, in itself, may provide part of the explanation on why little change in employee depersonalization for bank assistants was apparent.



2. Job Classification - Bank assistants were the most affected in terms of job responsibility. After automation their duties became more diverse with customer relations playing a larger role. Banks have made considerable progress in using customer relation courses for orientating their assistants in this area.

The majority of assistants were also the best informed in terms of the entire automated system. Again bank literature seems to be the reason. In general, bank assistants now seem to have gained a new level of responsibility and status within the organization.

Level 3 employees, clerks, were those most depersonalized by increased automation. Two factors seem most relevant in this finding.

1. Office Identification - Most clerks expressed a decrease in their daily contact with other employees after automation. Their jobs became more routine orientated and somewhat removed from the daily affairs of other employees. For example, some clerks would spend their entire day filing in a back room whereas, prior to automation, a great deal of their time was spent in the banking area.

Most clerks were not fully cognizant of the new automated system and thus unaware of new bank practices and unfamiliar with the type of work done by those higher up. This is contrary to past experience where most employees knew actually what the others were doing and most important why they were doing it.



2. Managerial Concern - Clerks have always been the last to reap any benefits from training courses. In most cases, management has not orientated these employees because the costs of doing so are relatively high and the resulting benefits to the bank are few. Clerks are paid rather small salaries for performing rather unimportant tasks. This seems to suggest that even though greater depersonalization may be apparent for bank clerks, management will only attempt to alleviate such conditions when these conditions have a negative effect on the goals of the organization. It seems that the resulting increase in depersonalization for bank clerks is having little effect on the organization as a whole.

In general, the results of the total staff indicate that depersonalization does not change to the degree disclosed in the original study. As mentioned, several factors seem to account for this, although future implications may well require empirical testing of those variables deemed most important by management.

### The Organization in Perspective

Most organizations are now using a cost - benefit approach to solving any major problems. This seems to be the direction Canadian banks are taking in dealing with their behavioral problems. For years Canadian banks have analyzed their economic system in this manner. The growth of behavioral problems has now made banks review their present political and social structures. Management is now



dealing with individuals as such rather than as over - all staff units:

"The organization draws upon the accumulated learning and experience of the individual, who brings to it certain socially inculcated attitudes that encourage a satisfactory accommodation to the organization's major values and expectations." <sup>37</sup>

Since banks are making numerous changes in their general philosophy as well as in their technical structure, it is the accommodation by the individual that warrants consideration. Banks must provide the proper atmosphere for a successful accommodation. If the employee cannot make the transition, then the organization must not only be able to recognize the fact but make the proper adjustment to ensure the health of the organization.

To effectively ascertain what problems are arising in the banking environment, management must recognize the condition of the environment and its variables:

"Anyone who conducts research on human behavior in organizations is always faced with the problem of ordering and conceptualizing a buzzing confusion of simultaneously existing, multilevel, mutually interacting variables." <sup>38</sup>

Banks have very few tools at their disposal for improving their environment. Their approach to behavioral problems is, at best, a static one hardly conducive

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<sup>37</sup> Robert Presthus, "Toward a Theory of Organization Behavior," Management and the Behavioral Sciences, ed. M. S. Wadia (Boston: Allyn and Bacon, Inc., 1969), p. 248.

<sup>38</sup> Chris Argyris, "Some Problems in Conceptualizing Organizational Climate: A Case Study of a Bank," 501.



to a dynamic environment. Banks will face increasing problems, in the behavioral area, with the growth of technology. Of late they have made some progress in overcoming minor dysfunctions but the real challenge is yet to come. If Canadian banks are to remain a viable force in the Canadian financial climate a pragmatic approach must be developed where management will adapt to any given change.



## CHAPTER VI

### SUMMARY AND CONCLUSIONS

The primary objective of this study was to empirically test whether increased automation causes greater depersonalization among Canadian bank employees.

To attain this objective, a sample of twenty-four bank employees of one particular bank in Canada were interviewed. An attitude scale, indicative of the perceived degree of depersonalization, was applied in a before and after design. Resultant changes in depersonalization for three different occupations were determined along with over-all changes for the entire staff complement. A non-parametric statistical technique was implemented to determine the direction and magnitude of the changes in depersonalization due to increased automation.

The nonparametric statistical results disclosed depersonalization changes for all employees although only one particular job classification, clerical, experienced a significant change. The change was toward greater depersonalization. Both supervisors and assistants experienced no significant change in the level of depersonalization due to increased automation. It was noted, however, that supervisors tended to experience a reduction in the level of depersonalization even though this reduction was insignificant.

In conclusion, the results of this study reject the hypothesis that Canadian bank employees experience a significant increase in the level of depersonalization



due to increased automation. The findings are somewhat contrary to what the theory suggests and what previous empirical studies have tended to disclose.

Since the study was conducted within certain constraints it seems reasonable to suggest that only further empirical work will validate the findings.

It is apparent, however, that this study has provided one approach to disclosing the behavioral implications evolving from organizational change. It is the writer's hope that Canadian banks will attempt to ascertain what effects derive from increased automation. Undoubtedly, the need for empirical studies, in this area, will become a necessity as soon as Canadian banks take full advantage of technological progress.



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## APPENDIX I

### QUESTIONNAIRE

This questionnaire is designed to determine what effect automation has on employee attitudes. The questionnaire will be applied before as well as after automation has taken place.

There are no right or wrong answers to be following ten questions. Please indicate your answer, to each question, by checking one of the six answers available. The results of the questionnaire will be kept strictly confidential.

1. Many times I feel as though I have little influence over the things that happen to me.

( ) Strongly Agree  
( ) Agree  
( ) Mildly Agree  
( ) Mildly Disagree  
( ) Disagree  
( ) Strongly Disagree

---

2. On my job it is possible to make errors without too much disruption.

( ) Strongly Agree  
( ) Agree  
( ) Mildly Agree  
( ) Mildly Disagree  
( ) Disagree  
( ) Strongly Disagree

---

3. The way I do my job is important to my fellow workers.

( ) Strongly Agree  
( ) Agree  
( ) Mildly Agree  
( ) Mildly Disagree  
( ) Disagree  
( ) Strongly Disagree

---



4. Many times this organization feels that getting the job done is more important than the people on the job.

( ) Strongly Agree  
( ) Agree  
( ) Mildly Agree  
( ) Mildly Disagree  
( ) Disagree  
( ) Strongly Disagree

---

5. If I ever stay home from work, this department would be in a real bind.

( ) Strongly Agree  
( ) Agree  
( ) Mildly Agree  
( ) Mildly Disagree  
( ) Disagree  
( ) Strongly Disagree

---

6. A person who likes to do work which requires thinking would like to perform my job.

( ) Strongly Agree  
( ) Agree  
( ) Mildly Agree  
( ) Mildly Disagree  
( ) Disagree  
( ) Strongly Disagree

---

7. Things are really regimented around here.

( ) Strongly Agree  
( ) Agree  
( ) Mildly Agree  
( ) Mildly Disagree  
( ) Disagree  
( ) Strongly Disagree

---



8. When I come to work each day, I look forward to a new and challenging experience.

( ) Strongly Agree  
( ) Agree  
( ) Mildly Agree  
( ) Mildly Disagree  
( ) Disagree  
( ) Strongly Disagree

---

9. Sometimes, I wonder just how important I really am around here.

( ) Strongly Agree  
( ) Agree  
( ) Mildly Agree  
( ) Mildly Disagree  
( ) Disagree  
( ) Strongly Disagree

---

10. I think my job is too mechanical.

( ) Strongly Agree  
( ) Agree  
( ) Mildly Agree  
( ) Mildly Disagree  
( ) Disagree  
( ) Strongly Disagree

---

Your time and cooperation have been greatly appreciated.

Comments:



## APPENDIX II

Employee Code Name	Present Branch	Previous Branch
SUP 1A	HASTINGS, VANCOUVER	REGINA
SUP 2A	FAIRMONT, CALGARY	HIGH PRAIRIE
SUP 3A	JASPER, EDMONTON	PINCHER CREEK
SUP 4A	SOUTH, EDMONTON	MORINVILLE
SUP 5A	CRESCENT, CALGARY	HIGH PRAIRIE
SUP 6A	CENTRE, CALGARY	HIGH PRAIRIE
SUP 7A	CENTRE, CALGARY	MORINVILLE
AST 1B	KERRISDALE, VANCOUVER	KAMLOOPS
AST 2B	HASTINGS, VANCOUVER	KELOWNA
AST 3B	FRASER, VANCOUVER	PRINCE GEORGE
AST 4B	FAIRMONT, CALGARY	HIGH PRAIRIE
AST 5B	MANITOU, CALGARY	THREE HILLS



## Appendix II (Continued)

Employee Code Name	Present Branch	Previous Branch
AST 6B	2 ND, EDMONTON	CAMROSE
AST 7B	MAIN, EDMONTON	REGINA
AST 8B	VILLAGE, EDMONTON	HIGH PRAIRIE
AST 9B	MAIN, EDMONTON	SASKATOON
AST 10B	NORTH, EDMONTON	ITUNA
CLE 1C	HASTINGS, VANCOUVER	KITIMAT
CLE 2C	HASTINGS, VANCOUVER	MOOSE JAW
CLE 3C	MAIN, CALGARY	MEDICINE HAT
CLE 4C	4 TH, CALGARY	CARDSTON
CLE 5C	MAIN, EDMONTON	PRINCE RUPERT
CLE 6C	FAIRMONT, CALGARY	NEW BRUNSWICK
CLE 7C	UNIVERSITY, EDMONTON	MANITOBA



## APPENDIX III

## EXHIBIT 1

November 12, 1970

The Divisional Supervisor - Personnel  
The Bank  
District Head Office  
CALGARY, Alberta

Dear Sir:

I am writing in regard to the introduction of computer systems in banks. Your main office in Edmonton has informed me that there is a possibility that certain branches of your bank will be automated in 1971.

At present I am in my final year of the Master of Business Administration Program at the University of Alberta. My thesis topic concerns the implications of automation on bank employees. Enclosed is a previous study of this nature done in the United States which may provide some insight into the details of such a study. It is my hope that your Bank would consider allowing me the opportunity of interviewing some employees before and after automation if in fact some of your branches will be automated in early 1971.

The results of such a study would not be made public, nor would the name of the bank in any way be mentioned. Hopefully, the results of such a study would also prove of value to yourselves.



... 2

In any case, I would greatly appreciate your thoughts on the feasibility of such a study. If you are interested, I would gladly travel to Calgary to discuss such a matter on any date that is convenient for you.

Yours truly,

Douglas E. Allen  
#404, 10818 - 81 Avenue  
Edmonton 60, Alberta

DEA/mrs

enclosed.



## APPENDIX III

## EXHIBIT 2

The Bank  
District Head Office  
Calgary, Alberta  
April 19, 1971.

The Manager  
The Bank

Dear Sir:

Mr. D. E. Allen was employed with us for the past two summers on our University Graduate program. We have agreed to assist him in the preparation of his thesis which he is currently writing, and in this regard he would like some of your staff to complete a short questionnaire. Mr. Allen will provide you with further details and your co-operation in assisting him is appreciated.

For identification purposes a specimen of his signature appears below.

Yours truly,

K. R. Walker  
Personnel Manager

---

D. E. Allen



## APPENDIX IV

Employee	Before Score	After Score	Difference in Scores	Rank for Job Classification	Rank with Less Frequent Sign	Over-all Ranking	Over-all Rank with Less Frequent Sign
SUP1A	200	260	+60	+ 3	3	+11	
SUP2A	330	220	-110	- 6		-17 1/2	17 1/2
SUP3A	290	360	+70	+ 4 1/2	4 1/2	+13 1/2	
SUP4A	250	220	-30	- 2		- 5 1/2	5 1/2
SUP5A	250	270	+20	+ 1	1	+ 4	
SUP6A	320	250	-70	- 4 1/2		-13 1/2	13 1/2
SUP7A	360	120	-240	- 7		-24	24
					T=8 1/2		
AST1B	460	420	- 40	- 4	4	- 8	8
AST2B	240	270	+ 30	+ 2		+ 5 1/2	
AST3B	210	400	+190	+10		+23	
AST4B	390	240	-150	- 9	9	-22	22
AST5B	370	260	-110	- 7	7	-17 1/2	17 1/2
AST6B	290	330	+ 40	+ 4		+ 8	
AST7B	270	310	+ 40	+ 4		+ 8	
AST8B	350	280	- 70	- 6	6	-13 1/2	13 1/2



## Appendix IV (Continued)

Employee	Before Score	After Score	Difference in Scores	Rank for Job Classification	Rank with Less Frequent Sign	Over-all Ranking	Over-all Rank with Less Frequent Sign
AST9B	320	310	- 10	- 1	1	- 2	2
AST10B	250	390	+140	+ 8		+20 1/2	
					T = 27		
CLE1C	270	390	+120	+ 6		+19	
CLE2C	350	450	+100	+ 5		+16	
CLE3C	280	420	+140	+ 7		+20 1/2	
CLE4C	300	350	+ 50	+ 3		+10	
CLE5C	290	300	+ 10	+ 1 1/2		+ 2	
CLE6C	340	330	- 10	- 1 1/2	1 1/2	- 2	2
CLE7C	310	380	+ 70	+ 4		+13 1/2	
					T = 1 1/2		T = 125 1/2









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